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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BURD, KEVIN MICHAEL	
ART UNIT	**PAPER NUMBER**
2631	

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary	Application No.	Applicant(s)	
	09/874,759	MELSA ET AL.	
	Examiner	Art Unit	
	Kevin M. Burd	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 13 August 2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 05 June 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6/01.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 6/5/2001 is being considered by the examiner.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. <u>The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.</u> The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 6, 8, 9, 11, 13, 15, 17, 21, 23, 24, 26, 28-30 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Awater et al (US 6,175,551).

Regarding claim 1, Awater discloses a method of employing peak cancellation to reduce the peak-to-average power ratio. A behavioral model of filters in a transmit path of the circuit is created (figures 4 and 5). The behavioral model is applied to a copy of the input data signal (figures 4 and 5). A peak value is detected (figures 4 and 5, element 52). The data point is connected to a threshold and the result is output (figures 4 and 5, element 64).

Regarding claim 2, Awater further discloses the data is in the frequency domain (figure 4). The behavioral model of filters is a frequency response estimate of filters in the transmit path of the circuit (figure 4, element 56 and column 4, lines 57-59). Awater discloses using a low pass filter to generate the cancellation signal instead of a stored reference function (column 4, lines 57-59). A peak is detected and an impulse is generated from the impulse generator 54 whose amplitude is equal to the peak amplitude minus the desired amplitude (column 4, lines 59-66). After filtering, the data is converted into the time domain (figure 4 element 62).

Regarding claim 4, the symbols are filtered and the entire signal is feed to adder 64. The signals are held in the elements 52, 54 and 56 for the length of delay 66.

Regarding claim 6, Awater further discloses the data is in the time domain (figure 4 and column 5, lines 10-22). The behavioral model of filters is a time response estimate of filters in a transmit path of the circuit (column 5, lines 16-22). Convolutional filters are used as stated in column 5, lines 10-22).

Regarding claim 8, Awater discloses a method of employing peak cancellation to reduce the peak-to-average power ratio. A behavioral model of filters in a transmit path of the circuit is created (figures 4 and 5). The behavioral model is applied to a copy of the input data signal (figures 4 and 5). A peak value is detected (figures 4 and 5, element 52). The data point is connected to a threshold and the result is output (figures 4 and 5, element 64). The peak cancellation involves a peak power or peak amplitude detector, a comparator to see if the peak power exceeds some threshold and a scaling of the peak and surrounding samples (column 3, lines 49-53).

Regarding claim 9, Awater further discloses the data is in the frequency domain (figure 4). The behavioral model of filters is a frequency response estimate of filters in the transmit path of the circuit (figure 4, element 56 and column 4, lines 57-59). Awater discloses using a low pass filter to generate the cancellation signal instead of a stored reference function (column 4, lines 57-59). A peak is detected and an impulse is generated from the impulse generator 54 whose amplitude is equal to the peak amplitude minus the desired amplitude (column 4, lines 59-66). After filtering, the data is converted into the time domain (figure 4 element 62).

Regarding claim 11, the symbols are filtered and the entire signal is feed to adder 64. The signals are held in the elements 52, 54 and 56 for the length of delay 66.

Regarding claim 13, Awater further discloses the data is in the time domain (figure 4 and column 5, lines 10-22). The behavioral model of filters is a time response estimate of filters in a transmit path of the circuit (column 5, lines 16-22). Convolutional filters are used as stated in column 5, lines 10-22).

Regarding claim 15, Awater discloses an apparatus for employing peak cancellation to reduce the peak-to-average power ratio. A behavioral model of filters in a transmit path of the circuit is created in the peak cancellation circuit (figures 4 and 5). The behavioral model is applied to a copy of the input data signal (figures 4 and 5). A peak value is detected (figures 4 and 5, element 52). The data point is connected to a threshold and the result is output (figures 4 and 5, element 64). The peak cancellation involves a peak power or peak amplitude detector, a comparator to see if the peak power exceeds some threshold and a scaling of the peak and surrounding samples (column 3, lines 49-53).

Regarding claim 17, Awater further discloses the data is in the frequency domain (figure 4). The behavioral model of filters is a frequency response estimate of filters in the transmit path of the circuit (figure 4, element 56 and column 4, lines 57-59). Awater discloses using a low pass filter to generate the cancellation signal instead of a stored reference function (column 4, lines 57-59). A peak is detected and an impulse is generated from the impulse generator 54 whose amplitude is equal to the peak amplitude minus the desired amplitude (column 4, lines 59-66). After filtering, the data is converted into the time domain (figure 4 element 62). The IFFT is shown as element 62 in figure 4.

Regarding claim 21, Awater further discloses the data is in the time domain (figure 4 and column 5, lines 10-22). The behavioral model of filters is a time response estimate of filters in a transmit path of the circuit (column 5, lines 16-22). Convolutional filters are used as stated in column 5, lines 10-22).

Regarding claim 23, Awater discloses an apparatus for employing peak cancellation to reduce the peak-to-average power ratio. A behavioral model of filters in a transmit path of the circuit is created (figures 4 and 5). The behavioral model is applied to a copy of the input data signal (figures 4 and 5). A peak value is detected (figures 4 and 5, element 52). The data point is connected to a threshold and the result is output (figures 4 and 5, element 64). The peak cancellation involves a peak power or peak amplitude detector, a comparator to see if the peak power exceeds some threshold and a scaling of the peak and surrounding samples (column 3, lines 49-53).

Regarding claim 24, Awater further discloses the data is in the frequency domain (figure 4). The behavioral model of filters is a frequency response estimate of filters in the transmit path of the circuit (figure 4, element 56 and column 4, lines 57-59). Awater discloses using a low pass filter to generate the cancellation signal instead of a stored reference function (column 4, lines 57-59). A peak is detected and an impulse is generated from the impulse generator 54 whose amplitude is equal to the peak amplitude minus the desired amplitude (column 4, lines 59-66). After filtering, the data is converted into the time domain (figure 4 element 62). The first IFFT is shown as element 28 in figure 4. The second IFFT is shown as element 62 in figure 4.

Regarding claim 26, Awater further discloses the data is in the time domain (figure 4 and column 5, lines 10-22). The behavioral model of filters is a time response estimate of filters in a transmit path of the circuit (column 5, lines 16-22). Convolutional filters are used as stated in column 5, lines 10-22).

Regarding claim 28, the scaling reduces the distortion by a number of decibels (column 6, lines 34-48).

Regarding claim 29, Awater discloses an apparatus for employing peak cancellation to reduce the peak-to-average power ratio. A behavioral model of filters in a transmit path of the circuit is created (figures 4 and 5). The behavioral model is applied to a copy of the input data signal (figures 4 and 5). A peak value is detected (figures 4 and 5, element 52). The data point is connected to a threshold and the result is output (figures 4 and 5, element 64). The peak cancellation involves a peak power or peak amplitude detector, a comparator to see if the peak power exceeds some threshold and a scaling of the peak and surrounding samples (column 3, lines 49-53).

Regarding claim 30, Awater further discloses the data is in the frequency domain (figure 4). The behavioral model of filters is a frequency response estimate of filters in the transmit path of the circuit (figure 4, element 56 and column 4, lines 57-59). Awater discloses using a low pass filter to generate the cancellation signal instead of a stored reference function (column 4, lines 57-59). A peak is detected and an impulse is generated from the impulse generator 54 whose amplitude is equal to the peak amplitude minus the desired amplitude (column 4, lines 59-66). After filtering, the data is converted into the time domain (figure 4 element 62). The first IFFT is shown as element 28 in figure 4. The second IFFT is shown as element 62 in figure 4.

Regarding claim 32, Awater further discloses the data is in the time domain (figure 4 and column 5, lines 10-22). The behavioral model of filters is a time response

estimate of filters in a transmit path of the circuit (column 5, lines 16-22). Convolutional filters are used as stated in column 5, lines 10-22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3, 5, 7, 10, 12, 14, 18, 22, 25, 27, 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Awater et al (US 6,175,551) in view of Flowers et al (US 5,754,592).

Regarding claim 3, Awater discloses the method stated above in paragraph 3. Awater does not disclose up sampling the data. Flowers discloses over sampling (up sampling) data prior to being input to a DAC (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the DAC to operate as a higher frequency.

Regarding claim 5, Awater discloses the method stated above in paragraph 3. Awater does not disclose up sampling the data. Flowers discloses over sampling (up sampling) data prior to being input to a DAC (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over

sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the DAC to operate as a higher frequency.

Regarding claim 7, Awater discloses the method stated above in paragraph 3. Awater does not disclose up sampling the data. Flowers discloses over sampling (up sampling) data prior to being input to a DAC (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the DAC to operate as a higher frequency.

Regarding claim 10, Awater discloses the method stated above in paragraph 3. Awater does not disclose up sampling the data. Flowers discloses over sampling (up sampling) data prior to being input to a DAC (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the DAC to operate as a higher frequency.

Regarding claim 12, Awater discloses the method stated above in paragraph 3. Awater does not disclose up sampling the data. Flowers discloses over sampling (up sampling) data prior to being input to a DAC (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization

noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the DAC to operate as a higher frequency.

Regarding claim 14, Awater discloses the method stated above in paragraph 3. Awater does not disclose up sampling the data. Flowers discloses over sampling (up sampling) data prior to being input to a DAC (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the DAC to operate as a higher frequency.

Regarding claim 18, Awater discloses the apparatus stated above in paragraph 3. Awater does not disclose up sampling the data where the data is input to the up sampler and the output is connected to the low pass filter. Flowers discloses over sampling (up sampling) data (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the downstream components to operate as a higher frequency.

Regarding claim 22, Awater discloses the apparatus stated above in paragraph 3. Awater does not disclose up sampling the data where the data is input to the up sampler and the output is connected to the low pass filter. Flowers discloses over sampling (up sampling) data (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of

Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the downstream components to operate as a higher frequency.

Regarding claim 25, Awater discloses the apparatus stated above in paragraph 3. Awater does not disclose up sampling the data where the data is input to the up sampler and the output is connected to the low pass filter. Flowers discloses over sampling (up sampling) data (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the downstream components to operate as a higher frequency.

Regarding claim 27, Awater discloses the apparatus stated above in paragraph 3. Awater does not disclose up sampling the data where the data is input to the up sampler and the output is connected to the low pass filter. Flowers discloses over sampling (up sampling) data (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the downstream components to operate as a higher frequency.

Regarding claim 31, Awater discloses the apparatus stated above in paragraph 3. Awater does not disclose up sampling the data where the data is input to the up sampler and the output is connected to the low pass filter. Flowers discloses over

sampling (up sampling) data (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the downstream components to operate as a higher frequency.

Regarding claim 33, Awater discloses the apparatus stated above in paragraph 3. Awater does not disclose up sampling the data where the data is input to the up sampler and the output is connected to the low pass filter. Flowers discloses over sampling (up sampling) data (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the downstream components to operate as a higher frequency.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Awater et al (US 6,175,551) in view of the instant application's disclosed prior art.

Regarding claim 16, Awater discloses the apparatus disclosed above in paragraph 3. Awater does not disclose the data is partitioned 512 data point symbols and represents 232 microseconds of time. However, the instant application discloses using 512 data point symbols is specified by the ANSI T1E1.4 committee (page 12). A 232 microsecond duration is set according to these data points as well (page 15). It would have been obvious for one of ordinary skill in the art at the time of the invention to

use well established or standard rules for determining the number of data points or data length. Using these rules allows data to be transmitted and received using a universal format and all systems using this format can recover the transmitted data.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Awater et al (US 6,175,551) in view of Flowers et al (US 5,754,592) further in view of the instant application's disclosed prior art.

Regarding claim 19, the combination of Awater and Flowers discloses the apparatus described above in paragraph 4. The combination does not disclose calculating a complex conjugate of the data and then flipping the complex conjugate. Page 14, line 18 to page 15, line 8, discloses the well known up sampling technique conjugate and flip technique for up sampling frequency domain data. It would have been obvious for one of ordinary skill in the art to use the well known up sampling technique taught by the instant application's disclosed prior art in the up sampler of the combination of Awater and Flowers. This technique increases the resolution in the representation of the signal (page 5, lines 1-2).

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Awater et al (US 6,175,551) in view of Flowers et al (US 5,754,592).

Regarding claim 20, the combination of Awater and Flowers discloses the apparatus described above in paragraph 4. The combination does not disclose setting a number of up sampled images to zero to reduce computation complexity and increase

computation speed in the IFFT. However, it is well known that reducing the amount of input to a circuit will reduce the time it take to process input data. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to minimize the amount of data input to the apparatus to minimize the time it takes to process the input data.

8. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Awater et al (US 6,175,551) in view of Flowers et al (US 5,754,592) further in view of Karam et al (US 5,113,414).

Regarding claim 34, Awater discloses the apparatus stated above in paragraph 3. Awater further discloses Awater does not disclose up sampling the data. Flowers discloses over sampling (up sampling) data prior to being input to a DAC (figure 5). It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the over sampling circuit of Flowers in the method of Awater to improve signal-to-quantization noise ratio without requiring substantial processing power as stated in the abstract. The over sampling will also allow the DAC to operate as a higher frequency. The combination of Awater and Flowers does not disclose a digital filter, an analog filter and amplifier. Karam discloses a predistortion arrangement including a digital filter 10, an analog filter 13 and an amplifier 15 shown in figure 4. This circuit arrangement allows noise and distortion to be filtered and the signal to be amplified prior to transmission to overcome noise in the transmission channel. The filters and amplifier allow the signal to be received and recovered correctly by the receiver. For

these reasons, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the filters and amplifier of Karam into the combination of Awater and Flowers.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin M. Burd
7/8/2005